multimatic

UPS

Uninterruptible Power Supply

MD-1000I / MD-2000I / MD-3000I

V 1.0 User Manual

Authentic Manual

Imprint

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multimatic Vertriebs GmbH reserves the right to make cosmetic or technical design changes that may serve to improve the system, manufacturing process or the product.

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1. Introduction

1.1 Forward

Dear User,

You will find this manual to be of great assistance. For this reason, we urge you to read it carefully before operating the unit.
It will provide you with information and instructions necessary to effectively and responsibly operate the uninterruptible power supply. It also offers advice on what to do in the event of malfunction. In addition, you'll find transport, storage and installation information here.

Guidelines presented in this document solely concern the supply of uninterrupted power. The installation and personnel performing the installation are subject to applicable national and local electrical codes and regulations.

Modification to contents of this manual may be necessary from time to time to accommodate technical changes. We have gone to great lengths to ensure the contents' accuracy and ease of comprehension. However, we would be grateful if you notify us of any errors or inaccuracies you find.

We accept no liability for errors or consequential damages resulting from those errors.

The uninterruptible power supply unit has been designed and built to protect sensitive electrical equipment against failure caused by poor power quality or power failure.

Read this manual carefully and completely, while paying careful attention to the safety guidelines!

Your company's technical support or a member of our team will be glad to assist you with your questions concerning this unit.

Sincerely,
multimatic Vertriebs GmbH

1.2 Scope of Application

The explanations found in this manual apply exclusively for the

uninterruptible power supply

as described in the Technical Information section as an entire system and for modules, subsystems and individual parts designed and built by **multimatic Vertriebs GmbH**.

(★ **11. Technical Information**)

1.3 Availability of Manual

Make sure this manual is always in proximity to the UPS to ensure it is there when and where needed.

1.4 Symbols Used in Manual

The abbreviation UPS appearing in this manual stands for uninterruptible power supply.

Read this document carefully to become familiar with the product before using it.

Keep the manual handy at all times, so you can reference it when needed.

Pass the manual on to future users of the product.

1.4.1 Warning levels

DANGER!

Text in which "DANGER!" appears warns you of dangers. If you neglect preventative measures, serious (irreversible), life-threatening injuries or death will occur!

WARNING!

Text in which "WARNING!" appears warns you of dangers. If you neglect preventative measures, serious (irreversible), life-threatening injuries or death may occur!

CAUTION!

Text in which "CAUTION!" appears warns you of dangers. If you neglect precautionary measures, slight or moderate injuries may occur!

ATTENTION!

Text in which "ATTENTION!" appears contains very important information about situations in which neglecting preventative measures can result in damage to the product, its function or objects in its vicinity.

This symbol indicates information that is especially useful or important.

1.4.2 Warning pictograms

1.4.2.1 Hazard vicinity warning

Generally hazardous area!

1.4.2.2 Specific warnings

Hazardous voltage!

Battery hazard!

1.4.3 Mandatory action symbols

Take action as stated in information and instructions provided in documents and by pictograms.

Disconnect via all-pole disconnect prior to beginning work!

1.4.4 General symbols

● This symbol indicates actions that you are required to perform.

- This hyphen introduces items in a list.

★ This arrow indicates a cross reference.
To keep things easily understandable, you'll find cross references directing you to other chapters on occasion.
Example: ★ **UM, 2 Safety Instructions**
This tells you to refer to User Manual,
Chapter 2 in the manual.
If the cross reference refers to a page, figure or item number, it will appear at the end of the cross reference.
Example: ★ **Fig. 4 - 4, Item 1**
This directs you to Chapter 4 in the User Manual, Figure 4, Item 1.

(3) Numbers in parentheses refer to items found in figures.

Must be recycled

Indicates components or assemblies that are subject to electronic waste disposal ordinances and regulations.

Indicates assemblies or parts that you are prohibited from disposing of as or in regular household rubbish.

✓ Prerequisite or something you must do:

✓The DC disconnect switch is switched to OFF.

1.5 Information Liability

This manual must be read by everyone, including

– users

– maintenance and cleaning personnel

– those responsible for disposal and recycling

of the device. They must understand and follow every instruction and all guidelines provided therein.

multimatic Vertriebs GmbH accepts no liability for damages caused by uninstructed or insufficiently instructed personnel!

1.6 Warranty Terms

Your receipt is your proof for your initial purchase. Make sure you keep in a safe place, because you will require it for warranty claims. In the event you transfer the product to the possession of another user, the warranty shall remain in effect. The new user requires the receipt and this explanation.

We guarantee the product you have purchased to be in good functioning order and technically as described in the enclosed documents when it left our premises.

The warranty period for custom-built or -configured units complies with the legislatively-regulated minimum.

This warranty does not apply in the following instances:

Defects caused by shipping, accident, natural catastrophes, abuse, vandalism, improper use, inappropriate maintenance or improper repair by an unqualified third party.

- Modifications performed by unauthorized persons, incorrect operation, other devices or equipment, improper installation or any modifications not authorized by multimatic Vertriebs GmbH
- Improper use, for example plugging the device into unsuitable sources of electrical power, attempts to overload the UPS, use in an unsuitable environment.
- Disregard of the instructions in provided documents.

- Incompatibility of product due to technical changes or regulations that occur after purchase.
- Incompatibility or malfunction caused by product components not installed by multimatic Vertriebs GmbH.
- Effects caused by normal product wear and tear.
- Defects caused by external apparatuses or devices.

Warranty periods for parts repaired or replaced under the unit's original warranty expire when the unit's warranty expires.

Units returned without accessories will be replaced without accessories. To be accepted, products returned must be shipped in their original packages.

In general, the warranty does not cover shipping costs.

The customer is responsible for repair and replacement costs and multimatic Vertriebs GmbH is not liable for damages, whether direct, accidental, unique or consequential damage, even if caused by negligence or other acts.

multimatic Vertriebs GmbH gives neither explicit nor implicit guarantees on this product, its quality, performance, saleability or suitability for a specific purpose. In some countries, the exclusion of implicit guarantees is not permitted by law. In such instances, the validity of all express and implicit guarantees is limited to the warranty period. When the warranty expires, all guarantees lose their validity. In some countries, law does not permit a limit of the period of validity of implicit guarantees, so that the limitation described above does not take effect.

1.6.1 Liability limitations

Claims for compensation are excluded, unless based on wrongful intent or gross negligence on the part of **multimatic Vertriebs GmbH** or its employees. Liability as per product liability laws remains unaffected. Under no circumstances are we liable for:

- Third-party claims filed against you the purchaser for losses or damages.
- Loss of or damages to your records or data or the costs for the recovery of these data.
- Economic damages (including profit or savings losses) or other related damages, even if we were informed in advance of the possible occurrence of such damages.

Under no circumstances, is **multimatic Vertriebs GmbH** liable for any accidental, indirect, unique, consequential damages or any other damages (without exception, whether loss of profit, business activity or business, business records, data or information or any other losses) that occur through the use of this product or in any conjunction with the product, whether due to a contract, damage claim, negligence, strict liability of claims, even if **multimatic Vertriebs GmbH** was informed in advance of the possibility of such an occurrence. This exclusion also includes any liability that could occur due to third-party claims on the original purchaser.

In some countries, law does not permit the limitation of accompanying or related damages or consequential damages, so that the explanation above does not take effect.

1.7 Transport and Storage

The UPS appliance shall be packed in its original packaging when transported to its site of operation, when returned to the seller or in the event it is moved to another site of operation.

The original package offers no protection in the event the package falls or is dropped. For this reason, products that have fallen must be examined by **multimatic Vertriebs GmbH** prior to operation.

Do not store or transport this device with its top upside down.

1.8 Installation Site

WARNING!

Do not install in an area where flammable vapours are present, for example, petrol/gasoline, storerooms, areas in which combustion-driven motors operate, etc.

The UPS appliance is designed for operation in ventilated rooms with ambient temperatures of 0 to 40° C.

If the UPS is subject to significant and quick temperature changes, condensation may develop. Should this be the case, it is necessary to give the unit at least 2 hours to acclimate.

Never place, install or operate the UPS in a damp environment. Keep fluids at a suitable distance away from the unit.

Do not place, install or operate the UPS near a source of heat.

You may install the UPS in either a horizontal or a vertical position. Vertical installation requires you use the feet; horizontal requires the use of a 19-inch rack.

Install and maintain a minimum distance of 10 cm from the appliance's back and front to other objects to ensure the UPS has enough air circulation to prevent high temperatures. Make sure the air vents are free of blockage through paper or other materials that might be stuck in the intake openings.

2. Safety Instructions

2.1 Introduction

The UPS is designed and built in accordance with technical guidelines and regulations for uninterruptible power supply equipment. It and its components, modules and assemblies individually and as an entire system meet the current safety code requirements and comply with the EU 2006/42/EG Machinery Directive.

The UPS is operationally safe, provided the user uses this appliance pursuant to said codes and regulations and the safety instructions, guidelines and precautions stated in this user manual.

2.2 Compliant Use

Use the UPS and its components solely for their intended purpose, which is the temporary supply of electrical power to electrical devices (230 V AC) while, together, not exceeding the total nominal capacity.

Any other use or use that exceeds said use is not in accordance with the intended purpose and may lead to personal injury or equipment damage!

Improper uses

The UPS is not intended for use:

- **in explosive,**
- **dust-laden,**
- **radioactively or**
- **biologically or chemically contaminated atmospheres.**

ATTENTION!

The UPS is Class A equipment. This product may produce electromagnetic interference. If this is the case in living areas, the user may be required to implement appropriate corrective measures.

2.3 Avoiding Personal Injury and Property Damage

Read the user manual carefully, making sure you understand the product.

Pay careful attention to the information and instructions concerning the installation, pre-operation and initial operation of the unit.

Operate this product only properly and in accordance with the intended use and the technical specifications provided.

Perform only the service and maintenance work that is described in the provided documents. Follow the stipulated actions and steps as described. Use only original parts obtained from **multimatic Vertriebs GmbH**.

2.4 Environmental Protection

When your product has reached the end of its service life, send it back to **multimatic Vertriebs GmbH** and we'll dispose of it compliant with environmental protection laws.

2.5 Power Connection

DANGER!

Use only an outlet socket with earthed/grounding contact or, if using a terminal block, connect protective conductor. Under no circumstances, operate the UPS without an earth/ground connection.

The socket you use must be readily accessible and close to the UPS unit. If using a permanent connection, keep the cable length as short as possible.

If operating with a generator, make sure not to reverse the connection's polarity.

Use only a VDE- and CE-approved power cable between the socket and the UPS. If wiring the UPS via permanent/direct connection, use a cable with suitable approval rating.

Use only a VDE- and CE-approved power cable to connect the protected equipment to the UPS. If wiring protected equipment via permanent/direct connection, use a cable with suitable approval rating.

Make sure the circuit breaker to protect the connected equipment always comes right before the connected/protected equipment; never rely on a central fuse placed in front of the UPS.

Do not use the UPS to power household appliances and power tools, such as portable heaters, vacuum cleaners, drills, hair dryers, toasters, etc.

Never connect to the UPS unit electrical equipment that could overtax it (laser printer, etc.).

Make sure the total current amperage of all the equipment connected to the UPS does not exceed 3.5 mA.

Keep power cables as short as possible and make sure they are installed code-compliant, including installation that avoids stumbling, exposure to heavy weight or sharp objects, etc.

Use only a VDE- and CE-approved power cable with suitable gauge to connect the protected equipment to the UPS. Make sure the circuit breaker to protect the connected equipment always comes right before the connected/protected equipment; never rely on a central fuse placed in front of the UPS. Never connect to the UPS unit electrical equipment that could overtax it (monitor inrush current).

2.6 Operation

Before connecting equipment to the UPS outlet, you must perform the initial configuration. Very important here is the output voltage going to the connected equipment.

The UPS device contains an energy storage facility (battery), which means the outlet can carry electricity even if the USP is not connected to a power supply.

To switch the UPS off completely, first, hold the OFF button for longer than 3 seconds and wait for the UPS to shut down. Next, disconnect the power supply connector from the device. Make sure no liquids or foreign materials gain access to the UPS' interior. To protect the UPS, it is best to avoid lasting output loads greater than 80%. The output load shown on the display is only a guide. To determine the actual output load, extra measurements with a suitable device are necessary.

2.7 Handling Batteries

DANGER!

Attention! Danger of shock and burns

Batteries can produce electrical shock and short circuit currents that are capable of burning tissue.

Keep unqualified persons away from batteries.

Do not place batteries in or around sources of heat, e.g. fire, because they may explode!

Do not open or destroy batteries. The electrolyte is extremely hazardous for persons and the environment (danger of burns to eyes and skin; poison).

WARNING!

- **Defective batteries must be disposed of compliant with environmental protection regulations.**

Under no circumstances ever dispose of batteries with regular household garbage.

Follow local disposal regulations.

2.8 Maintenance, Service and Malfunction

DANGER!

Attention! Danger of shock

Even after, you have turned off the power switch or broken the circuit to the battery, UPS components may still carry high voltage.

ATTENTION!

Only qualified persons with the required knowledge of precautionary measures are to perform and supervise work on batteries.

Keep unqualified persons away from batteries.

The following precautionary measures are necessary when working on UPS devices and batteries:

- **Remove wristwatches, rings and other metal objects**
- **Use only insulated tools that are compliant with electrical regulations and guidelines**
- **Wear protective glasses/goggles, gloves, face protection**
- **Do not dismantle the UPS**

3. Explanation of USB Function

This manual will provide you with fundamental information about single-phase online UPS systems, specifically how they function, use of the various functions and what you are to do in the event of malfunction. In addition, this manual contains information about transport, storage, handling and installation of UPS systems.

Guidelines presented in this document solely concern UPS requirements. The installation and personnel performing the installation are subject to applicable national and local electrical codes and regulations. Modification to the contents of this manual may be necessary from time to time to accommodate technical changes. We have gone to great lengths to ensure the contents' accuracy and ease of comprehension. However, we would be grateful if you notify us of any errors or inaccuracies you find.

We accept no liability for errors in this user manual or consequential damages resulting from those errors.

The UPS system (uninterruptible power supply) has been designed and built to protect sensitive electrical equipment, such as computers, workstations, electronic money handling machines, important business devices, telecommunication systems, process controls, etc., against failure caused by poor power quality or power failure. Such sensitive systems require comprehensive protection against electrical failure. Often, the failure may be caused by events outside the system (e.g. thunderstorm, breakdown of operations) or interference caused by nearby equipment (such as motors, air conditioners, machinery, welding, etc.).

Power supply malfunctions are typically:

- Quick and slow line voltage peaks, fluctuation
- Power failures
- Fast or slow frequency peaks and fluctuations
- Power line interference or transients

The UPS system monitors the abovementioned power supply parameters and protects the connected devices via suitable actions (e.g. switch over in the event of power surges, over voltage or drops).

The UPS' mode of installation modifies easily from upright, using the provided legs, to horizontal in a 19" rack and vice versa.

You'll find instructions for changing the installation mode in the chapter dedicated to this subject (★ **3.3 Changing Installation Mode**).

The advanced insulated-gate bipolar transistor (IGBT) technology and industrial quality design ensure the UPS will operate efficiently and dependably, even under tough conditions.

A powerful CPU integrates all the power stages, control and communication functions required to provide maximum protection and UPS function, including monitoring of the energy saving management, remote control and self-diagnostics. The unit's cleverly designed CPU communication system permits remote computer control with full functionality from any computer environment via standard RS-232 port.

The UPS' wide input voltage tolerance (120V~288V) permits under or over voltage correction without use of the battery, helping to extend the battery's operating life.

The cold start function ensures the UPS will start even in the event of a power outage.

A battery management system monitors the battery's charge to determine when the battery draw will cease, another feature that prolongs the battery's life span.

Advanced input voltage control minimizes the reactive power factor and increases efficacy. The unit's active power factor correction (PFC) delivers a power factor (PF) of greater than 0.99, which translates into superb energy efficiency.

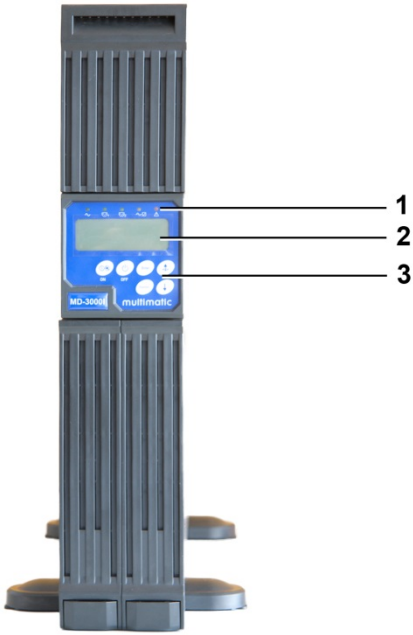
The adjustable bypass input voltage tolerance (low/high) prevents the unit from switching to the bypass mode in the event of low or over voltage.

Large choices of output voltages (200/208/220/230/240) permit the use of different voltage systems.

This UPS device was designed and built to comply with international electromagnetic standards.

3.1 Front Panel

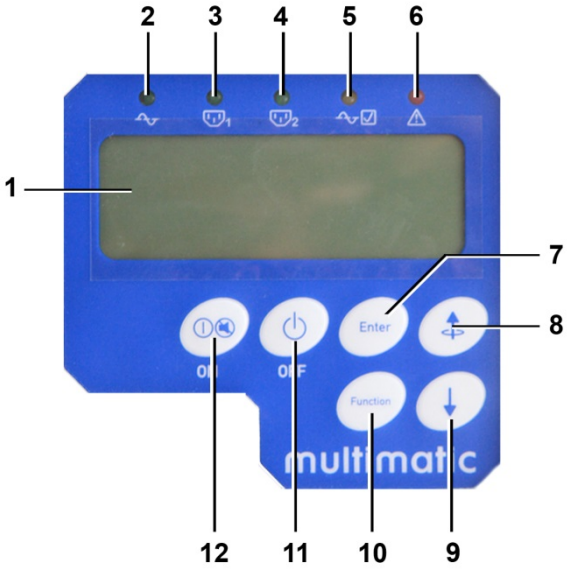
You'll find all the display and control elements you need for normal use on the UPS' front panel.



1 *Status LEDs*
2 *LCD display*
3 *Buttons*

Fig. 3-1 - 1 MD-1000I / MD-2000I / MD-3000I front view

3.1.1 LCD display (optional)



1 *LCD display*
2 *LED input voltage*
3 *Programmable output 1 LED*
4 *Programmable output 2 LED*
5 *Bypass LED*
6 *UPS system fault LED*
7 *Select*
8 *Scroll up*
9 *Scroll down*
10 *Other functions*
11 *UPS off*
12 *UPS on; mute alarm*

Fig 3-1 - 2 Front panel interfaces

3.1.2 Keypad

UPS On / Alarm mute (12)
functions:

- Turns UPS on.
- Deactivates audible alarm.

UPS off (11)
functions:

- Turns UPS off.

Other functions (10)
functions:

- Buzzer on/off
- Battery test
- Bypass power
- Output frequency synchronization window
- Inverter output voltage
- UPS operating mode
- Output voltage fine adjustment

Scroll down (9)
functions:

- Scrolls down menu by pages

Scroll to previous page / Change UPS settings (8)
functions:

- Scrolls up menu by pages
- Changes UPS settings

Select (7)
functions:

- Verifies selection

Manual bypass

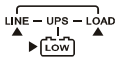
To activate the manual bypass, proceed as follows:

Press buttons 12 and 8 simultaneously for about 3 seconds, to change from normal operation to bypass mode.

The LED bypass indicator will blink constantly and an audible signal will sound.

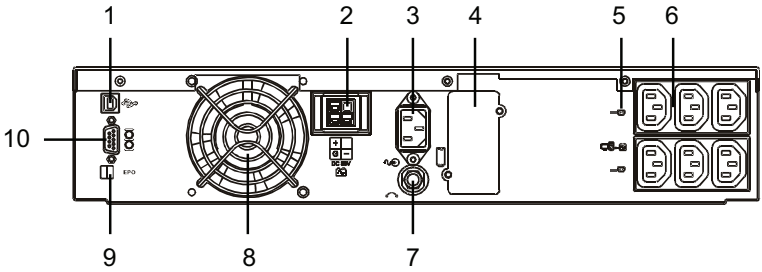
- Press buttons 12 and 8 simultaneously for about 3 seconds, to change from bypass mode to normal operation.

3.1.3 LCD display panel symbols

Item	Symbol	Description
1	*LINE*	Power supply (utility) or bypass source
2		Battery low
3		Battery problem
4		Output overload
5		Local wire problem
6	OFF	UPS shut off
7	FAIL	Abnormal UPS lock
8		UPS flow
9		4-digit display
10		Indicates which item to be measured
22	Er05	Weak or dead battery
23	Er06	Output short circuit
24	Er10	Inverter overload
25	Er11	UPS overheated
26	Er12	UPS output overload
27	Er**	Other faults

3.2 Rear Panel

3.2.1 MD-1000I



1 *USB port*
2 *Battery pack connector*
3 *Power input*
4 *Communication interface*
5 *Two programmable outputs*
6 *UPS output*
7 *Input circuit breaker*
8 *Fan*
9 *Emergency power off (EPO) port*
10 *RS-232 port*

Fig. 3-2 - 3MD-1000I rear panel

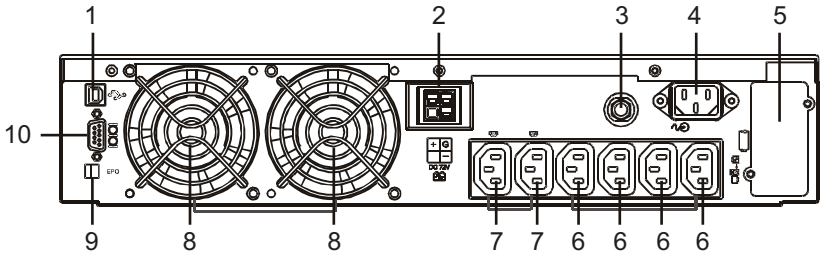
DANGER!

When the USP output and power input sockets are in connected states, they are capable of transmitting power.

Even if disconnected, dangerous electrical charges may be present inside the unit that could discharge hazardous high voltage at the connections.

As soon as the unit is connected to a source of power, the charger becomes active. That means without turning the UPS on, the battery charges.

3.2.2 MD-2000I



1 *USB port*
2 *Battery pack connector*
3 *Input circuit breaker*
4 *Power input*
5 *Communication interface*
6 *UPS output (non-programmable)*
7 *UPS output (programmable)*
8 *Fan*
9 *Emergency power off (EPO) port*
10 *RS-232 port*

Fig. 3-2 - 4MD-2000I rear panel

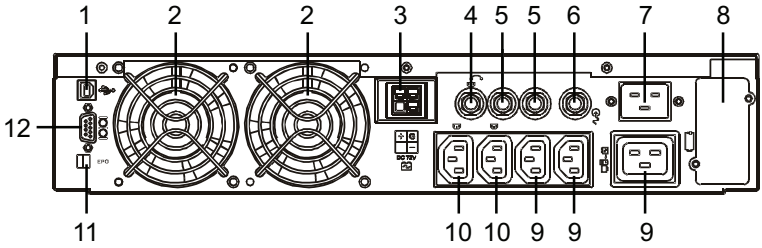
DANGER!

When the USP output and power input sockets are in connected states, they are capable of transmitting power.

Even if disconnected, dangerous electrical charges may be present inside the unit that could discharge hazardous high voltage at the connections.

As soon as the unit is connected to a source of power, the charger becomes active. That means without turning the UPS on, the battery charges.

3.2.3 MD-3000I



1 *USB port*
2 *Fan*
3 *Battery pack connector*
4 *Circuit breaker for two programmable outputs*
5 *Circuit breaker for two non-programmable outputs*
6 *Power input circuit breaker*
7 *Power input*
8 *Communication interface*
9 *UPS output (non-programmable)*
10 *UPS output (programmable)*
11 *Emergency power off (EPO) port*
12 *RS-232 port*

Fig. 3-2 - 5MD-3000I rear panel

DANGER!

When the USP output and power input sockets are in connected states, they are capable of transmitting power.

Even if disconnected, dangerous electrical charges may be present inside the unit that could discharge hazardous high voltage at the connections.

As soon as the unit is connected to a source of power, the charger becomes active. That means without turning the UPS on, the battery charges.

3.2.4 UPS output

IEC 10 A socket for equipment connection

DANGER!

The protective earth conductor must be connected!

Make sure you observe the input voltage requirements that appear on the identification label and in the technical information provided in this manual.

3.2.5 Emergency power off (EPO) port

The emergency power off port permits the connected equipment to shut down in emergencies. This function is available for use in the event of connected equipment emergency.

WARNING!

Make sure to isolate this electrical circuit from hazardous electrical circuits.

CAUTION!

Do not connect the EPO to electrical circuits that connect directly to the power mains.

Make sure power mains lines are heavily insulated.

The EPO switch must have snap-action and at least 24 V DC / 20 mA capacity and install without connection to another electrical circuit.

To function properly, the EPO signal must remain active for a minimum of 20 ms.

3.2.6 Relay card (potential-free)

Fig. 3-2 - 6Relay card (potential-free)

Pin configuration:

1	2	3	4	4	5	6	7	8	9	10

1 UPS in bypass mode (Bypass)
2 Normal power source (normal: closed contact)
3 Normal power source (normal: open contact)
4 Inverter on
5 Battery low
6 Battery bad or abnormal
7 UPS alarm
8 General
9 UPS positive (+) signal
10 UPS negative (-) signal

The shutdown function activates after +6~+25VDC between PIN 9 and Pin 10 is applied for 5 seconds.
Each relay contact has a load capacity of 40VDC/25mA.
Installation: random insert.
Flexible output for N.C. (normal closed) or N.O. (normal open)
Sets via the repositioning of Jumper Pin1-2 or Pin2-3 from JP1-5.
The shutdown function activates within a minute after the flow of current ceases when Pin1-2 of both jumpers CN1 and CN6 are connected. The shut-down function activates only from C3 via PIN9-10 when Pin2-3 of both CN1 and CN6 are closed.

3.2.7 SNMP cards (Web card)

Fig. 3-2 - 7SNMP cards (Web card)

For information about installing SNMP cards, please see the SNMP card manual enclosed with the UPS documents.

3.2.8 USB port

The UPS port allows you to connect the UPS to a PC.

3.2.9 Fan

Fan cools UPS.

3.2.10 Power input

IEC power plug

MD-1000/2000 - C13/10A
MD-3000 - C19/16A

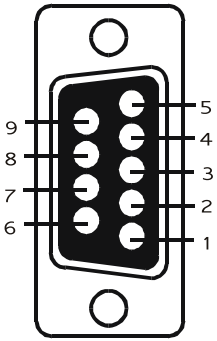
The unit connects to the power supply by means of the enclosed power cable with Schuko plug.

DANGER!

The protective earth conductor must be connected!

Make sure you observe the input voltage requirements that appear on the identification label and in the technical information provided in this manual.

3.2.11 RS-232 port



PIN 3: RS-232 Rx

PIN2: RS-232Tx

PIN5: Earth/Ground

Fig. 3-2 - 8RS-232 ports

3.3 Installation Changes

The UPS features placement versatility to accommodate specific needs:

- Vertical standing on feet
- Horizontal in 19" rack

Depending on your chosen means of installation, you will need to turn the LCD display (tower) or mount brackets to the unit (19" rack).

3.3.1 Tower

Fig. 3-3 - 1Tower configuration

Proceed as described in the following:

- Turn the display, so you can read it when the unit is standing.
- Install the feet.

ATTENTION!

Make sure the floor under the UPS is even and level.
The floor must have sufficient weight-bearing capacity.
For specific weight-bearing requirements, you'll find the UPS weight in the technical information (★ Chapter 11 Technical Information)

Turning the display:

Fig. 3-3 - 2Turning of display

- The display is capable of turning 90°.

3.3.2 Rack installation

Fig. 3-3 - 3Rack installation

Proceed as described in the following:

- Turn the display, so you can read it when the unit is in the rack.
- Mount the brackets to the housing.
- Insert the UPS into its compartment in the 19"-rack.

Fig. 3-3 - 4Rack brackets

- Mount the brackets to both sides of the housing.

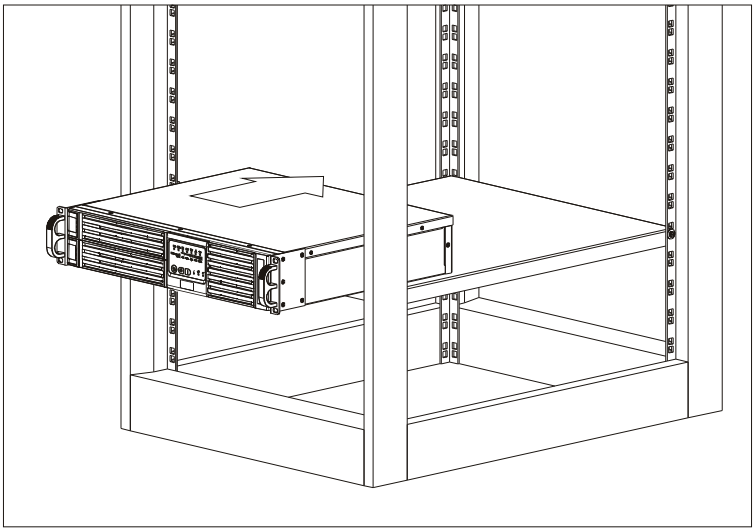
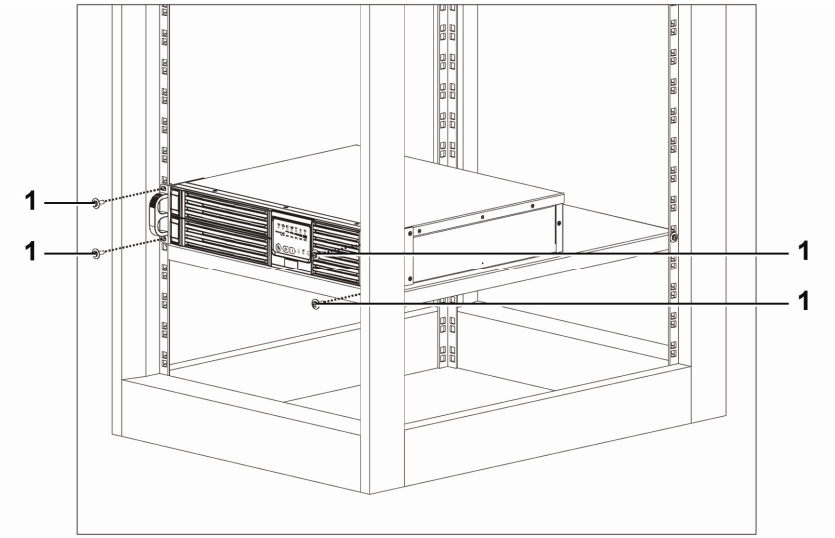


Fig. 3-3 - 519"-rack

- Insert the UPS into the 19"-rack.



1 *Screws*

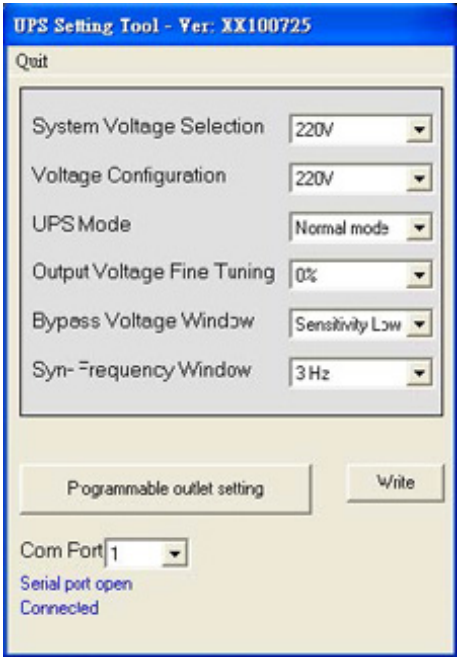
Fig. 3-3 - 6Fixing the UPS in the 19"-rack

- Use the screws (1) to fasten the UPS to the rack.

Upon completion, you may connect the UPS and put it into operation.

3.4 Operational Modes and Voltage Settings

Download the UPS Setting Tool software and open the software, so that you have the window shown below open.



System configuration settings

1. Selecting power supply voltage: Select the input voltage 230V.
2. Next, select the output voltage from: 200V/208V/220V/230V/240V.
3. UPS mode: Select normal mode /CF50*/CF60*.
4. Output voltage fine tuning: output voltage 0 - ±3%
5. Bypass voltage: low or high

	Low	High
220V-system	184V ~ 260V	194V ~ 260V

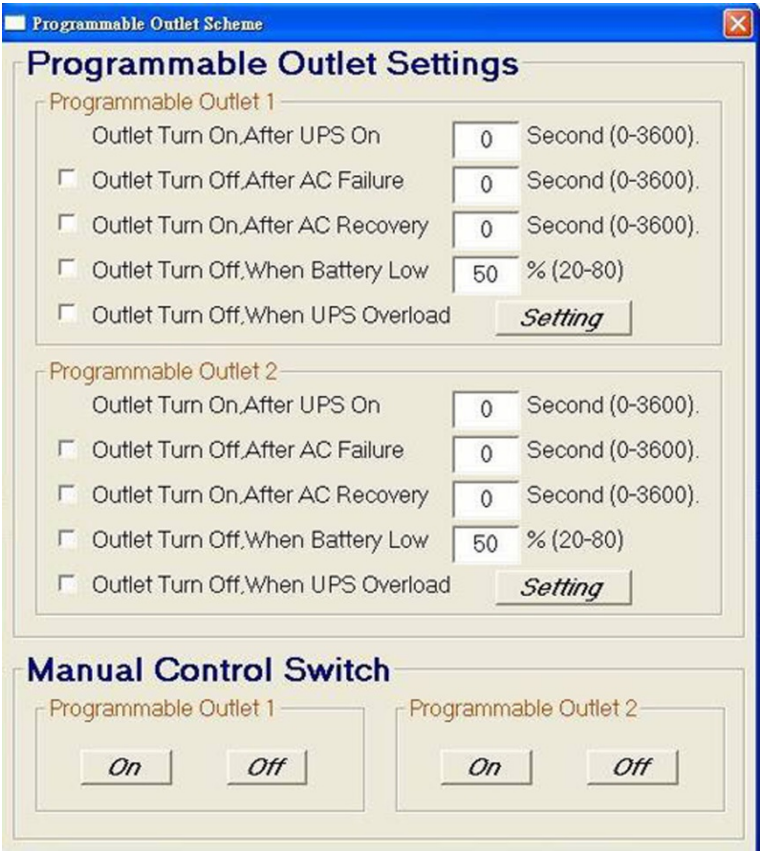
6. Syn-Frequency Window: Select 3Hz/1Hz inverter frequency range
7. Com. port: Select the PC's communication port
8. Click Write to confirm the configuration settings. The UPS sounds two audible tones to indicate you have successfully made the settings.
9. After you have completed the configuration, shut the UPS down to make sure the system saves all the settings in the EEPROM. To activate the new setting, restart the UPS.

NOTE: *CF50/CF60 = Frequency inverter mode 50 to 60Hz or vice versa.

Programmable output settings

To meet the power needs of less critical equipment, the UPS comes with 2 programmable outputs. You can deactivate these outputs to shut down less critical equipment while the UPS is running on the battery or to reduce the load in order to ensure the critical equipment will continue to receive power.

Click Programmable Outlet Scheme to make the following settings:



1. "Outlet turn on, after UPS on" allows you to set the time delay. Set the delay between the time when the UPS turns on and the time when the output automatically activates. Select "0" if you want the outlet to activate immediately when the UPS powers up.
2. "Outlet turn off, after AC failure" permits you to make setting for power failure events. Select this option to shut the output off automatically within the predetermined time frame in the event of a power outage, in order to shut down less critical equipment to allow the more critical equipment more battery time for back-up, etc.
3. "Outlet turn on after AC recovery." Use this option to set the time when the output will automatically reactivate after regular power has been restored.
4. "Outlet turn off when UPS overload" Select this option to turn off the outlet automatically when the battery has a specified remaining capacity, which you specify here. This permits you to shut down less critical equipment in order to allow the more critical equipment more battery time for back-up, etc.
5. "Outlet turn off, when UPS overload": This item allows you to specify that the outlet automatically switches off (bypass mode) during an overload event, in order to provide more critical equipment with power as described in the following: Continuously via bypass, or via return to normal operation, if the shutdown of less critical equipment has successfully remedied the overloaded status.
6. To perform further configurations, you need to click Setting. Consider new settings successfully completed when the UPS emits two audio signal tones. After you have completed the configuration, shut the UPS down to make sure the system saves all the settings in the EEPROM. To activate the new setting, restart the UPS.
7. Manual Control Switch: Click On or Off to activate or deactivate programmable outputs and overwrite all previous settings.

4. Storage and Unpacking

4.1 UPS Storage

If you don't put the UPS into operation immediately, you need to follow the instructions below:

- Always store the unit and any accessories in their original packaging.
- Suggested ambient storage temperature is 0 to +40° C.
- Protect this product and the packaging against moisture.

If you are storing the UPS longer than 4 months, it is necessary, when you reach 4 months, to connect the UPS and the external battery string (optional) to a power source for about 8 hours to avoid extensively expending the charge.

4.2 Unpacking the UPS

- Remove the box in which the product came and the packing materials.
- Always keep the UPS in a horizontal position.
- Compare the packing list to the package contents to determine if anything is missing. Notify the vendor immediately if something is missing or if you have received something you did not order.
- In addition, inspect the contents for any damage. Report any shipping or handling damages immediately:
  - Save the boxes and packing materials completely for potential claims.
  - Notify the manufacturer immediately and/or your vendor.
  - Notify the shipping company immediately.

5. System Function

The UPS operates continuously employing double conversion online topology. It processes the power provided by the power source, providing uninterrupted, clean, single-phase power for the critical equipment.

Besides furnishing the connected equipment with power, the UPS charges the internal battery, keeping it charged to its capacity. In the event of a power failure or disturbance, the UPS continues to provide uninterrupted, clean power to the UPS output, supplied by the battery.

5.1 UPS Schematic Diagram

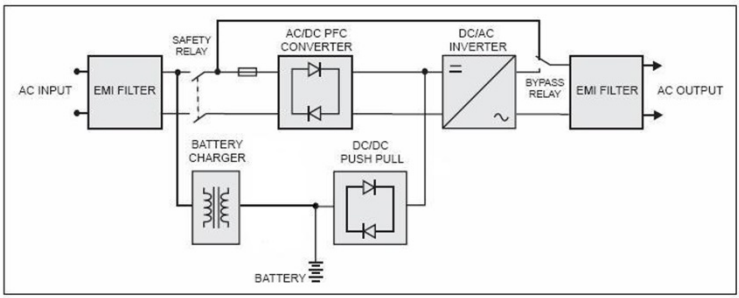


Fig. 5-1 - 1Block diagram

The block diagram depicts the individual UPS modules and displays their interaction roughly.

Important UPS components are:

- AC to DC power converter (rectifier)
- AC to DC high frequency power inverter
- Smart battery charger
- String consisting of durable maintenance-free batteries
- DC to DC push-pull inverter
- Static bypass lead
- Input and output EMI filter

The following table contains a summary of the UPS' power input and battery workings.

Power Supply (utility) Status	**UPS Operating Mode**	**LED Display**
Normal power	Power converter (rectifier) converts AC to DC, battery charges, inverter converts DC to AC, providing clean stable power	~, 1, 2 LEDs illuminate
Power supply (utility) abnormal (over or under voltage) / unavailable	Power converter and charger cease operating, Battery discharges via DC~DC protective circuit and delivers power to the inverter. Load continues to receive power from the inverter. Audible alarm sounds, the UPS is operating in battery mode.	~ LED off, LED illuminates
Power supply (utility) abnormal / unavailable, battery almost discharged	Power converter and charger cease operating, Battery discharges via DC~DC protective circuit and delivers power to the inverter. Audible alarm sounds with fast and short intervals, indicating battery charge is becoming critical and the inverter will soon cease to deliver power.	~ LED off, & ⚠ LED illuminates

5.2 UPS Operating Mode - Normal

Normal UPS operation is as shown below:

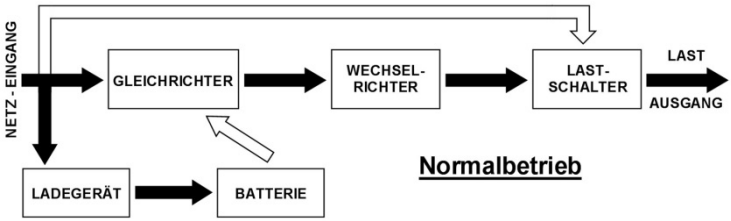


Fig. 5-2 - 1During normal power supply

The inverter converts DC into clean, stable AC. Output LEDs 2 and 4 light.

Abnormal UPS operation is as shown below:

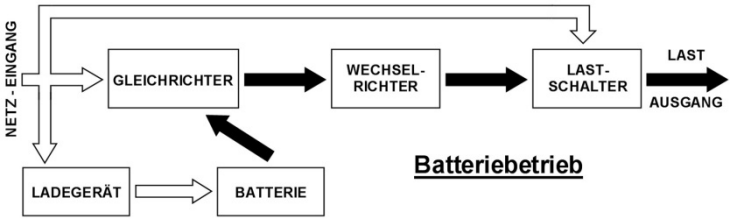


Fig. 5-2 - 2During abnormal power supply

If the power supply is abnormal, the UPS battery automatically transmits power to the inverter, shuts off the charger and the AC-DC power converter (rectifier). The inverter converts the DC to AC, in order to supply the connected equipment with uninterrupted energy.

As soon as the power coming from the supply returns to normal, the UPS opens the AC-DC power converter (rectifier), shuts off the DC-DC converter and turns the charger on.

During a power outage, the UPS operates as shown in (★ Fig. 5-2 - 1 During normal power supply). When battery level becomes too low, the audible alarm signal begins and continues until the battery shuts down. The UPS automatically stops battery-supplied power when battery capacity reaches a certain limit in order to prevent complete discharging. The UPS starts automatically when the mains is again available.

5.3 Overload

UPS operation when overloaded is as shown below:

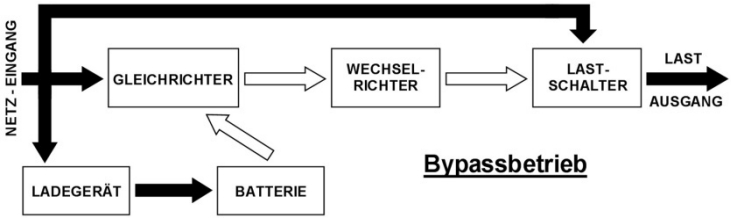


Fig. 5-3 - 1 Overloaded situation

Generally, modern electronics and IT equipment produce inrush current when they start. The magnitude of the inrush current varies depending on the equipment. Sometimes the current can be 6 times as high as measured capacity, while other devices generate inrush that is insignificant.

The UPS has an overload protection that protects it from inrush current. If the overload exceeds 105~120% of its capacity, it automatically switches to bypass within 30 seconds, in order to protect the inverter. As soon as the overload drops below <105%, the UPS returns to the inverter mode. If the UPS load exceeds 150%, the inverter automatically shuts down.

5.4 Inverter

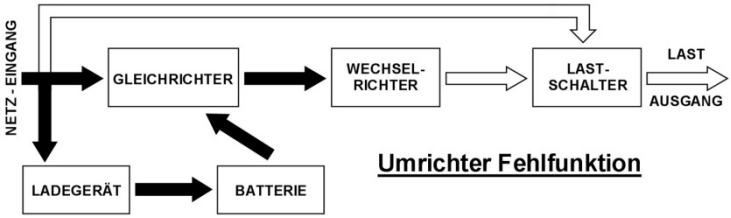


Fig. 5-4 - 1Inverter malfunction

Output short circuit
If a short circuit occurs in the output while the connected equipment is receiving current from the inverter, the UPS automatically shuts down the inverter and ceases supplying the equipment with power. LEDs indicate malfunction and the audible alarm goes off. Once the short circuit has been remedied, the UPS does not automatically start, but requires manual action to restart.

5.5 Inverter - Excessive Internal Temperature

Raised temperatures in the UPS automatically set off the bypass mode. The UPS switches back over to normal operation, once the temperature has returned to normal. If excessive termperatures occur while the energy supply is abnormal, the audible alarm sounds and the LEDs indicate malfunction. The UPS ceases to supply the equipment with power.

If a power outage exceeds the duration of the UPS' power supply, the UPS will shut down to protect the battery from deeply discharging. When the mains comes back on, the UPS kicks back on, energises connected equipment and controls the recharging of the battery/battery string.

The UPS has many outstanding features:

- Absolutely no interruptions or change in signal if a primary power source outage occurs
- Pure sine wave output. The quality of the output voltage is significantly better than that of the mains input.
- Processor-controlled bypass
- Input Power Factor Correction (> 0.95).
- LCD status and operating display
- Excellent Power Factor of 0.8
- Powerful and extensive communication interfaces
  - RS-232 is standard
  - USB is standard
  - Programmable switch contacts are standard.
  - NOT-HALT EPO contact is standard.

6. UPS Installation and Hook-Up

All instructions in technical information pertaining to the operating environment and operating conditions are mandatory and necessary to the proper function and operation of the UPS.

For the installation of the UPS in a tower or rack configuration, the following instructions apply:

- Avoid extreme temperatures and relative humidity.
- Follow the instructions provided for the horizontal rack installation.
- Make sure the unit has adequate ventilation with sufficient unhindered airflow.
- Be careful when integrating the UPS in other systems, e.g. machines or switch gear cabinets. Make sure the UPS' environment remains within the specified temperature requirements. If heat is prone to accumulate in the environment, you must act to provide suitable ventilation.
- Only a base plate is suitable to anchor the unit.

6.1 UPS Connection

These models come equipped with plug-and-socket connectors.

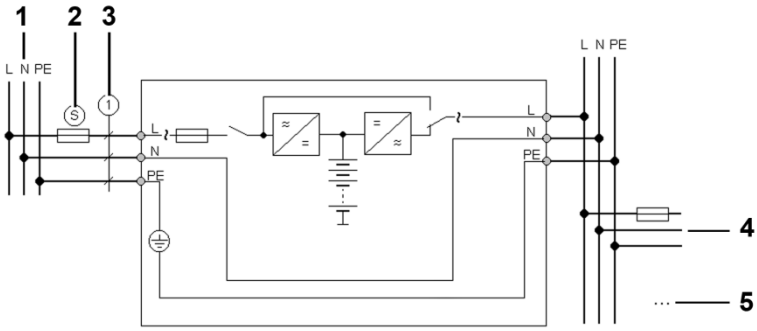
DANGER!

The UPS system contains components with high voltage and amperage. Improper use or handling can lead to electrical shock, injuries with death and/or property damage.

The protective earth conductor must be connected! If it is not grounded, the connected equipment is also not earthed.

If operating with a generator, make sure not to reverse the connection's polarity.

If the UPS is in an emergency stop (NOT-HALT) cycle, the UPS output will still carry power. The connected equipment receives electricity for the duration while the UPS' electricity backup function is operating.



1 *Power mains*
2 *16 A*
3 *1.5 mm²*
4 *Load 1*
5 *Load 2*

Fig. 6-1 - 1UPS and connected equipment connections

6.2 UPS Communication Interfaces

The UPS has convenient communication features for data transfer.

ATTENTION!

Only a single communication port can be active. The USB port has priority over the RS-232 port.

If a communication cable is connected, the software can exchange data with the UPS. The software gathers information from the UPS about the power supply status. In the event of a power emergency, the software backs up the data and shuts down the equipment properly.

6.2.1 RS-232 port

Use only those cables specified in the Chapter "Accessories" (1 : 1).

Pin	Configuration	
2	RS-232 Tx	Receiving line Rx or shut down SD
3	RS-232 RX	Transmitting line Tx
5	Ground	GND

The communication interface is completely isolated via galvanic means.

6.2.2 SNMP communication interface

The UPS can be ordered or fit with a SNMP interface.

6.3 Equipment Connection Sequence

- Connect the UPS to source of power, but make sure the power source and the UPS are both reliably shut down.
- Before connecting equipment to the UPS outlet, you must perform the initial configuration.
- Connect the equipment to the UPS, making sure that all the equipment is turned off.

6.3.1 EPO connection configuration

Function	Connection wire gauge	Suggested gauge
EPO	4 - 0.32 mm^2 (12 - 22 AWG)	0.82 mm^2 (18 AWG)

Leave the EPO plug installed on the UPS' EPO port, even if you don't plan to use the EPO function.

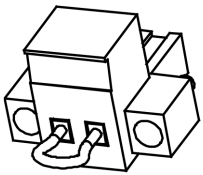


Fig. 6-3 - 1EPO plug

Follow the instructions for the EPO port as stated in **Chapter 3.2.5 EPO port.**

7. System Operation and Display

7.1 UPS Modes and Display Messages

Operating this system involves different operational modes and control communications.

7.2 USP User Instructions

WARNING!

The user of this UPS system must invariably follow and adhere to the instructions and guidelines provided in this manual at all times. The user may perform only those actions described in the following and the user must perform them with great care:

- Controls: energizing the UPS and switching it on and off
- Reading the display and interpreting audible warnings
- Activating the test operation
- Use the communication interface, but if the UPS installation includes a permanent connection, the connection to a PC or other systems should be already present.

Thanks to comprehensive protective and safety functions that the UPS performs in conjunction with the connected equipment, the UPS's operation is completely automatic. The user need only energize and turn the unit on and off. In addition, communication interfaces allow the transfer of data via SNMP adapter, which, however, is not necessary for the regular operation of the system.

7.2.1 Turning on the UPS

Connect the power cable to the UPS.

The UPS starts.

Fig. 7-2 - 1 UPS power cable connected

Hold the button USV Ein down (★ Fig. 3-1 - 2, Item 12) until the unit emits an audible alarm. The UPS will perform a self test during initialisation.

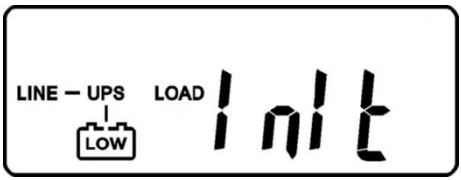


Fig. 7-2 - 2 Self test

If the initialisation was successful, the input voltage will appear on the LCD display.

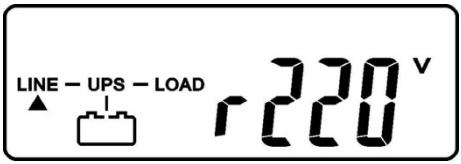


Fig. 7-2 - 3Main display

If the system fails the self test, it will indicate failure on the LCD display.

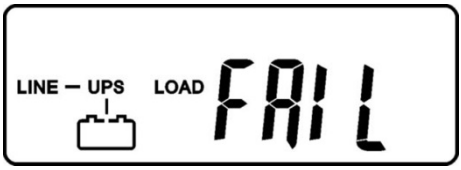


Figure. 7-2 - 4 Failure

7.2.2 Turning off the UPS

Hold the button USV Aus down (★ Fig. 3-1 - 2, Item 11) until the unit emits an audible alarm. The UPS shuts down.

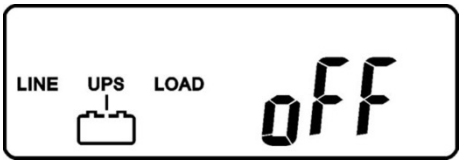


Fig. 7-2 - 5UPS is off

Please remember that the UPS shuts down only the outputs. To completely shut down the UPS, you must disconnect the power cable. Bear in mind that the connected equipment will no longer have power.

7.2.3 Menu

7.2.4 Readings

With the Scroll Down (★ Fig. 3-1 - 2, Item 9) Scroll Up (★ Fig. 3-1 - 2, Item 8) keys, you can view the various values monitored by the system.

Menu structure:

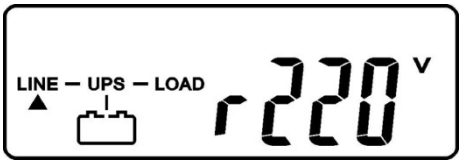


Fig. 7-3 - 1Input voltage

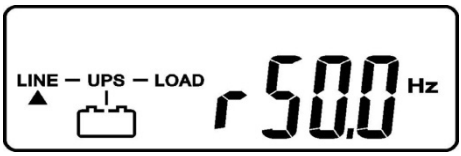


Fig. 7-3 - 2Input frequency

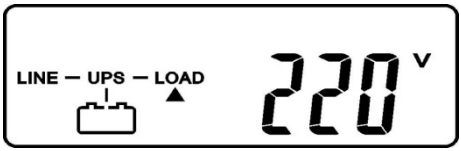


Fig. 7-3 - 3Output voltage

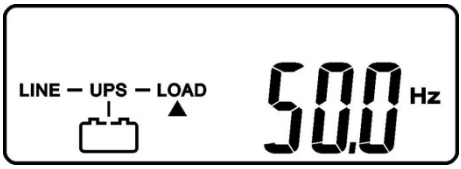


Fig. 7-3 - 4Output frequency

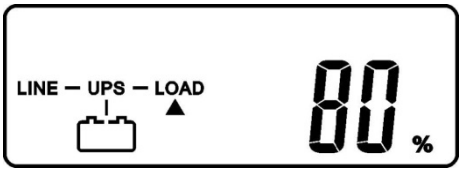


Fig. 7-3 - 5Capacity in use

Fig. 7-3 - 6Battery charging voltage

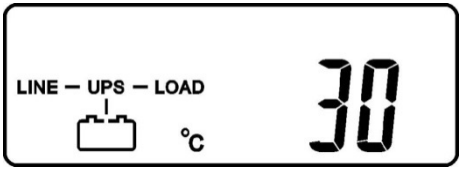


Fig. 7-3 - 7Temperature inside UPS

7.2.5 Menu functions

- Press Other Functions (★ Fig. 3-1 - 2, Item 10) to view the menu.

Menu structure:

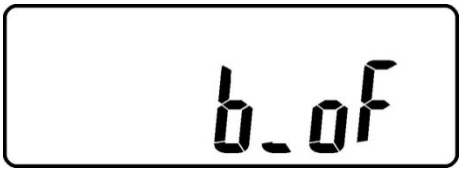


Fig. 7-3 - 8Audible signal ON / OFF

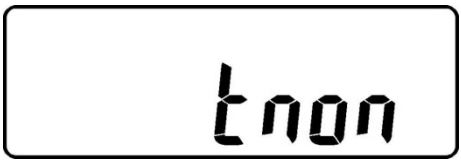


Fig. 7-3 - 9Run self test

Fig 7-3 - 10 Bypass voltage

Fig. 7-3 - 11 Bypass frequency

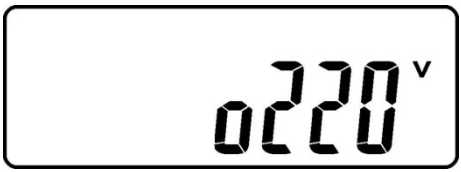


Fig. 7-3 - 12 Inverter output voltage

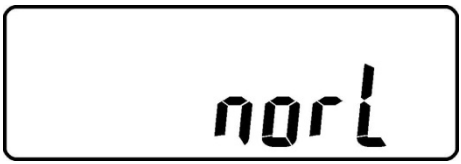


Fig. 7-3 - 13 UPS operating mode: Online, 50Hz or 60Hz at output

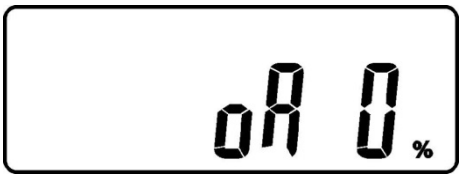


Fig. 7-3 - 14 Inverter output settings:
+1% -1%, +2% -2%, +3% -3%

ATTENTION!

Consult your dealer or specialist before you change the settings in this menu. Wrong settings may cause the system to malfunction or even damage the UPS irreparably.

You'll find a description of the parameters in the following table.

Parameters	Possible Settings	Standard Value

7.3 Replacing Batteries

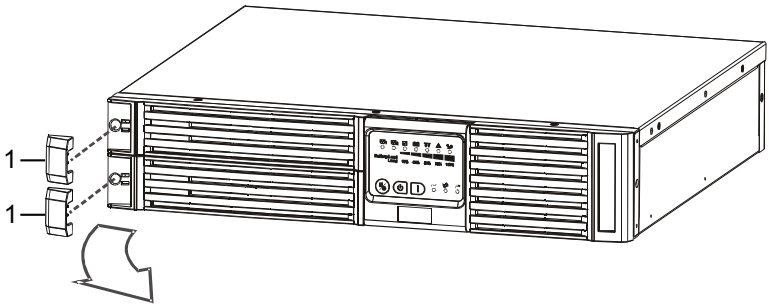
DANGER!

Risk of electrical shock

Battery replacement must be performed by QUALIFIED SERVICE PERSONNEL ONLY!

Even when the UPS is turned off, the batteries and UPS components carry hazardous electrical charges.

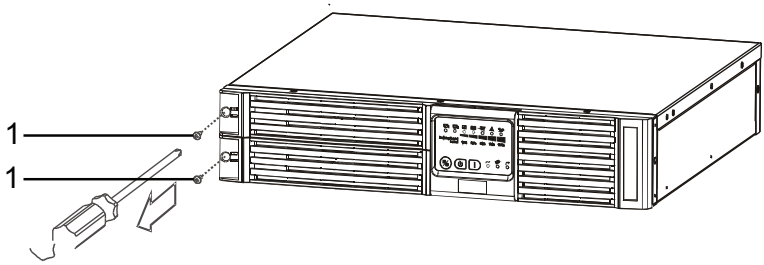
To replace batteries, please proceed as described in the following:



1 *Covers*

Fig. 7-4 - 1Removing covers

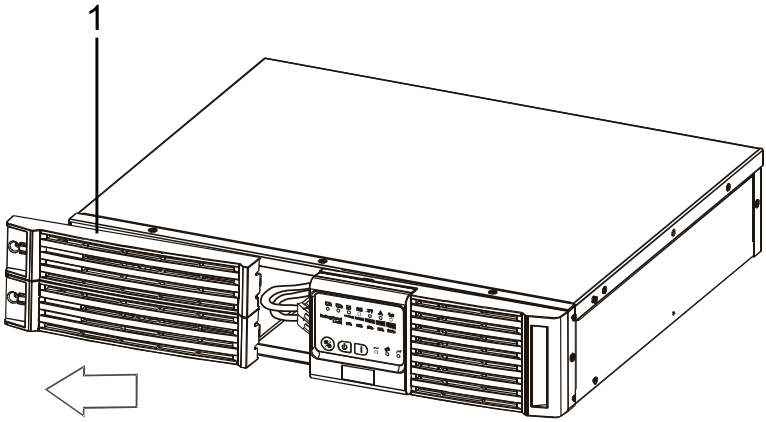
- Remove the covers (1) on the UPS' front panel.



1 *Screws*

Fig. 7-4 - 2Screws

- Remove both screws (1)

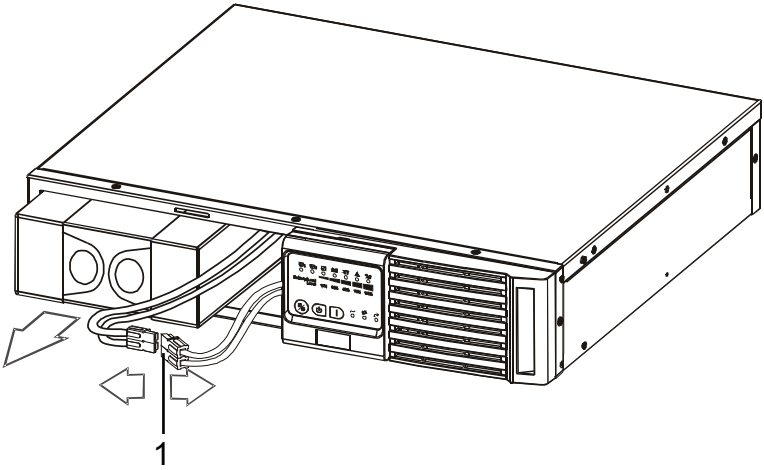


1 *Front panel cover*

Fig. 7-4 - 3Front panel cover

- Slide the front panel cover (1) to the left out of the housing.

Model MD-1000I

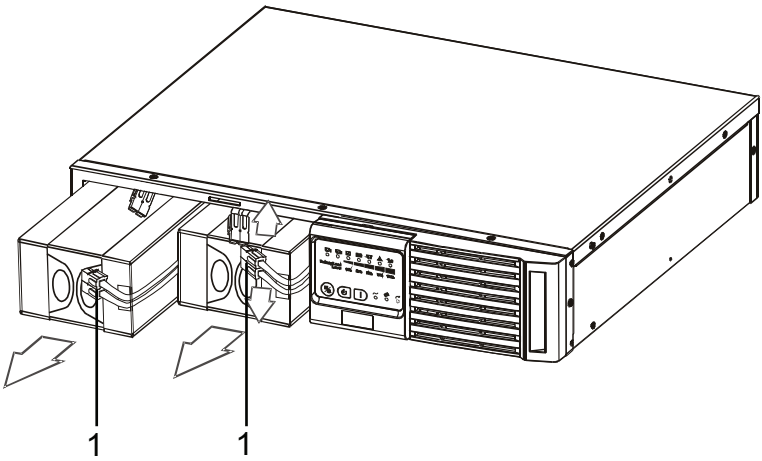


1 *Connector*

Fig. 7-4 - 4MD-1000I

- Unplug the connector (1)
- Pull the battery out of the housing.

Model MD-2000I and MD-3000I



1 *Connector*

Fig. 7-4 - 5MD-2000I and MD-3000I

- Unplug the connector (1)
- Pull both batteries out of the housing.

8. Trouble Shooting Guide

WARNING!

Only authorised qualified service personnel are to perform repairs or corrective actions to remedy UPS system malfunctions.

Situation Description	Audible Signal Description
UPS malfunction, serious problem	Long continuous audible signal
UPS malfunction, power still provided via inverter or bypass	Single continuous audible signal with ~2-second interval
Battery mode	Single short audible signal with ~1-second interval
Battery low	Very fast and short continuous signal
Verify/RS-232 connection	2 short, fast audible signal tones
Service mode ok	1 faster and shorter audible signal tone
UPS starts first with self-test	2 continuous fast and short audible signal tones repeating in ~2-second intervals.

Situation	Malfunction Message / Meaning	Solution
UPS failure LED Read the failure code indicated by LEDs.	1. Er05 battery weak or defective	1. Check if the battery is properly connected. Check battery voltage to determine if the batteries are charged and free of defect. If necessary, charge the batteries 8 hours.
	2. Er12 Overload	2. Disconnect the uncritical equipment from the UPS outputs until the overload has subsided. Check to see if insufficient cable insulation has caused a short circuit. If necessary, replace the cable(s).
	3. Er11 (UPS Excessive temperature)	3. Clean plugged up vents. Check to make sure the fan is working properly. If necessary, ask your local dealer to replace the fan.
	4. Local cable or earthing problem	4. Check to see if the "L" and "N" phases of the AC power lead are wrongly wired or if the earth neutral wire voltage exceeds the limit.
	5. Er14 (Fan defective)	5. Check to see if the fan is operating properly. Do not attempt to replace the fan. Contact your local distributor.
	6. Other faults codes	6. Contact your local dealer for assistance.

UPS doesn't provide interval time or time is shorter than expected.		If the back-up time is still shorter than required after charging for 8 hours, please contact your local dealer for technical assistance.
UPS appears to be normal, but there is absence of output voltage.	Check to see if all power cables are properly connected.	If the problem persists, contact your local dealer for technical assistance.
Unusual sounds or smells		Shut down the entire system immediately. Turn off the power supply and contact your technical customer service.
UPS cannot run battery		Check the battery connections. If the batteries are weak, let them charge for a while. If the problem persists after you have charged the batteries, replace them. If the problem still persists, contact your local dealer for technical assistance.

Malfunction code:

Code	Meaning
Er05	Battery weak or defective
Er06	Output short circuit
Er07	EPO mode
Er11	UPS under excessive temperature
Er12	Inverter overload
Er14	Fan defective
Er18	EEPROM data error
Er24	Power supply low (<85/170V) and battery not connected
Er28	Bypass overload
Er31	EEPROM data doesn't match. Settings of control and driver boards don't match.

If you don't find the failure in the table, please contact our service department. You'll need to provide the following information when you talk to them.

1. *Model number, serial number*
2. *Date on which the problem first occurred*
3. *Detailed description of the problem*

9. Software

- Connect the RS-232 or USB cable connector to the UPS communication port.
- Connect the RS-232 or USB cable socket to a suitable RS-232/USB computer port.

A suitable software package can monitor and process UPS settings and operational status via communication port.

Software is available from the manufacturer, distributor or the provided hotline, where you'll receive useful information for selecting the most suitable software based on your needs and UPS.

Visit our Web site for further information:

http://www.edelstrom-usv-systeme.de

The following basic functions are supported by any software package:

- Identification and display of UPS power source status
- Display of UPS output status
- Identification and display of the battery string charge status
- Shutting down open applications if power fails
- Shutting down operating system
- Generating log files
- General monitoring of UPS data and conditions (diagnostics)

You'll find more detailed information about the individual software packages, such as installation, operation and scope in the software manual.

In Chapter "Included Components and Accessories," you'll find a suitable, tested software package.

10. Maintenance and Service

With just a little maintenance, you will have the uninterrupted use of your UPS system for a long time.

Please note that the dependability of the UPS is very much affected by its environment. Temperature and relative humidity must be kept at reasonable levels. In addition, the area around the UPS should be kept as clean and dust-free as possible.

At the optimum ambient temperature of 22° C, the typical battery life span is approx. 4 years. Special-purpose, high-performance batteries will significantly increase longevity, reaching around 8-10 years.

Regularly, (every 6-12 months), you should check to make sure the system back-up capacity suffices for the intended purpose. If this is not the case, it is necessary to replace the batteries.

10.1 Determining the Back-up Capacity

WARNING!

Before you begin this procedure, make sure all open documents and data are backed up/saved. Also, be sure to inform all personnel who may be affected.

There are two methods of determining the back-up capacity.

Method a)
is suitable for measuring the actual duration of time until the connected equipment loses power.

Method b)
Permits determination of the remaining power capacity after a run using a specified back-up time. Connected equipment usually does not lose power in this instance.

To use one of these methods, it is necessary for you to simulate a situation that forces the UPS into battery back-up operation (e.g. turning off building circuit breaker). Do not disconnect the power cable, as this will break the earthing (neutral) connection. Once you have completed the test, switch the circuit breaker back on and start the UPS as usual with the ON button.

Remember that after the test the batteries are low. The UPS system will need to run several hours (min. 5 hr) on the mains before it reaches about 80% capacity.

If you fail to perform a battery back-up test regularly, we suggest, for the sake of prevention, replacing the batteries every two years in order to safeguard the availability of your system against failure caused by battery degradation.

10.2 Service Log

Always record all maintenance and service work performed on the UPS system in the Service Log.

Date	Work Performed	Performed By

10.3 Service Hotline

If contrary to expectations, you experience problems with the UPS or if you require assistance with safety-related information, please use our Service Hotline, either phone or fax:

Phone: 0049 / (0) 741 – 9292-0
Fax: 0049 / (0) 741 – 9292-33

If for whatever reason, telephone service is unavailable to you, you may use the following e-mail:

E-mail: kundenservice@multimatic-usv.de

10.4 Maintenance and Service Contracts

multimatic Vertriebs GmbH provides maintenance and service that guarantee the best possible dependability and availability of your UPS system.

11. Technical Information

Model		MD-1000I	MD-2000I	MD-3000I
Output				
Output in VA		1000 VA	2000 VA	3000 VA
Output in W		800 W	1600 W	2400 W
Power factor		0.8		
Topology		Online double-conversion		
Placement		Tower or 19"-rack		
Safety		CE		
Input				
Voltage range		120/140/160 - 288 VAC		
Voltage	Basis charge percent (0~33/33~66/66~100%)			
	Under voltage	120/140/160Vac		
	Under voltage start	170Vac		
	Over voltage	288 VAC		
	Over voltage start	278 VAC		
Frequency		50/60 Hz auto-select, ± 5Hz		
Phases		Single-phase with earth		
PF		> 0.99 at full measured linear load		
Typical transfer time		0 ms.		
Leakage current		≤ 3.5 mA		
Surge protection		300 Joule		
Output				
Output (INV. mode)	Voltage	230V, adjustable to 200/208/220/230/240		
	Voltage setting	≤± 1% until weak battery warning		
	Frequency (synchro-nised range)	3Hz or 1Hz (setting via software)		
	Frequency (battery mode)	±0.1% (0.05~0.06Hz) if not synchronised with line		
	Crest factor	3:1		
	Total harmonic distor-tion	≦3% THD (linear load) ≦7% THD (non-linear load)		
	Dynamic response (ms)	< = 60ms/5%		
	Wave form type	True sine wave		
Efficiency	AC mode (full load)	85%	85%	88%
	Battery mode (full load)	83%	83%	85%
Battery system				
Type		12V/7.2Ah	12V/7.2Ah	12V/9Ah
Number of batteries		3	6	6
Back-up time (full load)		>7min.	>7min.	>5min.
Recharge time		4 hours to 90%		
Charge current (max.)		1.1A	2.16A	2.7A
Charge voltage VDC (DC high)		41.0Vdc±0.5	82.0Vdc±0.5	82.0Vdc±0.5V

	V	V	
Hot swappable battery	Yes		
Internal battery	Yes		
DC leakage current	≤ 30uA (±10uA) with AC not in use and the unit off		
Battery type	Sealed, maintenance-free, lead battery		
Transfer time			
AC to DC	None		
Inverter to bypass	2.5ms (typically)	None	
DC start	Yes		
Self diagnostics	Switch located on panel or software		
Front panel			
LED	Load level/Battery level/ Battery mode/ Normal mode/Bypass mode/ Self test/ Weak/Bad battery/Local cable failure/ Failure/ Overload/ Programmable output 1/Programmable output 2		
Keypads	ON key/ OFF key/ (Test/Alarm reset key)		
Protection			
Overload	(AC mode) < 105% unlimited > 106% ~ 120% for 30 seconds, then bypass mode > 121% ~ 150% for 10 seconds, then bypass > 150% immediate transfer to bypass Continuous audible signal (tone)		
	(Battery mode) < 105% unlimited > 106% ~ 120% for 30 seconds, then shut down > 121% ~ 150% for 10 seconds, then shut down > 150% for immediate shut down Continuous audible signal (tone)		
	(Bypass mode) < 105% unlimited > 106% ~ 120% for 250 seconds, then shut down > 121% ~ 130% for 125 seconds, then shut down > 131% ~ 135% for 50 seconds, then shut down > 136% ~ 145% for 20 seconds, then shut down > 146% ~ 148% for 5 seconds, then shut down > 149% ~ 157% for 2 seconds, then shut down > 158% ~ 176% for 1 seconds, then shut down > 177% ~ 187% for 0.32 seconds, then shut down > 188% for 0.16 seconds, then shut down Continuous audible signal (tone)		
Short circuit	Bypass mode: input circuit breaker Normal mode: output circuit breaker		

		Battery mode: output circuit breaker		
EPO		UPS shuts down immediately		
Excessive temperature	Normal mode	Transfer to bypass mode		
	Battery mode	UPS shuts down immediately		
Audible alarm				
Battery mode		Audible signal every 1.5 seconds once		
Weak battery		Audible signal every 0.2 seconds once		
Overload		Audible signal every 3 seconds once		
Failure		Continuous audible signal (or every 3 seconds once)		
Physical				
Dimensions (HxWxD in mm)		88(2U)x440x 405	88(2U)x440x 650	88(2U)x440x 650
Weight		15.7kg	29.4kg	29.7kg
Input connector		10A, IEC 320-C14	10A, IEC 320-C14	16A, IEC 320-C20
Output connector		(6) 10A,IEC 320-C13		(4) 10A,IEC 320-C13 (1) 16A,IEC 320-C19
Environmental				
Operating temperature		0-40		
Noise level		< 50dBA		
Relative humidity		0 to 90% (without condensation)		
Interfaces				
Type		1 *USB port and 1*RS-232 port		
SNMP (optional)		Energy management by SNMP manager and Web browser		
Operating systems		Windows 95/98/NT/2000/XP Novell NetWare, Linux, etc.		

Standards and certification	
Safety	IEC/EN 62040-1-1,IEC 60950-1
Performance	IEC/EN 62040-3
EMC	IEC/EN62040-2 Class A, FCC Part 15
Safety	CE,UL, cUL, FCC

11.1 Included Components and Accessories

In the following, you will find a list of components that **multimatic Vertriebs GmbH** has carefully selected, specified and tested for use in this UPS. Please check to make sure that nothing is missing.

11.1.1 Components

Qty.	Name	Function / Graphic	Article No.	Included
1	UPS electronics, incl. battery		**MD-1000I** **MD-2000I** **MD-3000I**	X
1	User Manual	Printed in German		X
	Software package *multimatic Management Software*	CD-ROM Power supply shutdown and diagnostics software 1 License Windows/Novell 1 License UNIX, LINUX, MAC	multimatic Management Software	X
	LAN/RS-232-connector	Interface cable		X
	USB cable			X
	Connecting lead (IEC 10 A, straight)			X
	Output cable MD-1000I MD-2000I (IEC 10 A, straight)			X
	Output cable			X

	MD-3000I (IEC 16 A, straight)			
2	Brackets	Brackets for 19"-rack		X
2	Feet	Feet for tower variant		X

11.1.2 Communication ports (optional accessories)

Name	Article Number
Relay card	222302000434
SNMP card	AR1041, AR1042

11.2 Wear Parts

The components listed below are parts that need replacement because of wear caused by regular operation of the UPS. These parts are not covered by warranty.

Wear Parts	Function	Article Number
XXXX XX XX ** Battery 12 V xx Ah	Energy storage (electricity)	Subject to specific model and UPS configuration. See accessories or consult multimatic Vertriebs GmbH.

** For battery replacement, see current battery part number or consult multimatic Vertriebs GmbH.

12. Declaration of Conformity

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DIE USV-SPEZIALISTEN

EG – Konformitätserklärung

Anschrift:	Multimatic Vertriebs GmbH Im Wasen 2 D- 78667 Villingendorf Deutschland
Produktbezeichnung:	**UNTERBRECHUNGSFREIE STROMVERSORGUNG**
Modell:	***MD 1000 I***

Das oben beschriebene Produkt ist im gelieferten Zustand konform mit folgenden Richtlinien:

2004/108/EG: Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.

2006/95/EG: Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.

Die Konformität mit den Richtlinien wird durch Anwendung folgender Normen sichergestellt.

Sicherheit		**Elektromagnetische Verträglichkeit (EMV) Klasse C2**	
Nummer	**Ausgabe**	**Nummer**	**Ausgabe**
EN62040-1	2009	EN62040-2	2006

Villingendorf, den 20.11. 2012

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(Marcel Dägele / Geschäftsführer)

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Anschrift:	Multimatic Vertriebs GmbH Im Wasen 2 D- 78667 Villingendorf Deutschland
Produktbezeichnung:	**UNTERBRECHUNGSFREIE STROMVERSORGUNG**
Modell:	***MD 2000 I***

Das oben beschriebene Produkt ist im gelieferten Zustand konform mit folgenden Richtlinien:

2004/108/EG: Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.

2006/95/EG: Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.

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Villingendorf, den 20.11.2012

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EG – Konformitätserklärung

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Produktbezeichnung:	**UNTERBRECHUNGSFREIE STROMVERSORGUNG**
Modell:	***MD 3000 I***

Das oben beschriebene Produkt ist im gelieferten Zustand konform mit folgenden Richtlinien:

2004/108/EG: Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.

2006/95/EG: Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.

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